UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/730,719	12/06/2000	Eugene A. Roylance	10002891-1	8597

7590 07/14/2004

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER	
THOMPSON, JAMES A	

ART UNIT	PAPER NUMBER
2624	3

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/730,719	ROYLANCE, EUGENE A.	
	Examiner	Art Unit	
	James A Thompson	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 06 December 2000 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Curry (US Patent 5,479,584).

Regarding claim 1: Curry discloses a method comprising providing a set of image processing templates (figure 3b(94) and column 7, lines 6-9 of Curry), each image processing template associated with one of a plurality of image enhancement procedures (column 8, lines 39-42 of Curry).

Said method further comprises storing said bitmap image at a bit depth suitable for processing by each of said plurality of image enhancement procedures (column 8, lines 56-62 of Curry). Since the bit depth of the image data is based on the input device (column 8, lines 56-62 of Curry), the bit depth will therefore be suitable for the types of image enhancement processing that are available for said device.

Said method further comprises windowing said stored bitmap image (column 8, lines 31-34 of Curry) with each said image processing template to identify matching regions in said bitmap image (column 8, lines 35-39 of Curry) suitable for processing by

said associated one said plurality of image enhancement procedures (column 8, lines 39-45 of Curry).

Said method further comprises selectively applying said associated one of said plurality of image enhancement procedures to each said identified region to generate an enhanced raster image of said bitmap image (column 8, lines 40-42 and lines 45-47 of Curry). Said bitmap data is input as raster image data (figure 9(172) and column 8, lines 50-52 of Curry).

Regarding claim 2: Curry discloses printing said enhanced raster image (column 9, lines 13-17 of Curry).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 5-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curry (US Patent 5,479,584) in view of Wright (US Patent 5,986,681).

Regarding claim 5: Curry discloses a method comprising providing a set of image processing templates (figure 3b(94) and column 7, lines 6-9 of Curry), each image processing template associated with one of a plurality of image enhancement procedures (column 8, lines 39-42 of Curry) for improving image quality (column 9, lines

13-17 of Curry). Since the enhanced data is output to a printer (column 9, lines 13-17 of Curry), the print quality will also be enhanced.

Said method further comprises storing said bitmap image at a bit depth suitable for processing by each of said plurality of image enhancement procedures (column 8, lines 56-62 of Curry). Since the bit depth of the image data is based on the input device (column 8, lines 56-62 of Curry), the bit depth will therefore be suitable for the types of image enhancement processing that are available for said device.

Said method further comprises windowing each said template over said stored bitmap image (column 8, lines 31-34 of Curry) to identify matching regions in said bitmap image matching said template (column 8, lines 35-39 of Curry).

Said method further comprises selectively applying said one associated of said plurality of image enhancement procedures to each said identified region to generate an enhanced raster image of said bitmap image (column 8, lines 40-42 and lines 45-47 of Curry). Said bitmap data is input as raster image data (figure 9(172) and column 8, lines 50-52 of Curry).

Said method further comprises printing said enhanced raster image (column 9, lines 13-17 of Curry).

Curry does not disclose expressly that, said plurality of image enhancement procedures include a toner conservation procedure to reduce toner consumption.

Wright discloses a toner conservation procedure (column 5, lines 18-23 of Wright).

Curry and Wright are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include toner conservation as one of the image enhancement procedures. The motivation for doing so would have been to save toner on many documents when a dark gray may be suitable (column 1, lines 63-67 of Wright). Therefore, it would have been obvious to combine Wright with Curry to obtain the invention as specified in claim 5.

Regarding claim 6: Curry discloses that said plurality of image enhancement procedures includes resolution enhancement technology (RET) (figure 7a and column 8, lines 15-21 of Curry). An increased number of bits is used for each pixel (column 8, lines 19-21 of Curry), thus producing an enhanced resolution.

Regarding claim 8: Curry discloses that said plurality of image enhancement procedures includes halftone image enhancing technology (column 7, lines 5-9 of Curry). A binary image, and therefore halftone image, is processed by one of a plurality of templates (column 7, lines 5-7 of Curry) and enhanced by said template (column 7, lines 7-9 of Curry).

5. Claims 3-4, 7, 12-14 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curry (US Patent 5,479,584) in view of Wright (US Patent 5,986,681) and Harrington (US Patent 5,953,464).

Regarding claim 3: Curry discloses that said plurality of image enhancement procedures includes resolution enhancement (figure 7a and column 8, lines 15-21 of

Curry). An increased number of bits is used for each pixel (column 8, lines 19-21 of Curry), thus producing an enhanced resolution. Curry further discloses that said plurality of image enhancement procedures includes halftone image enhancement (figure 5a and column 7, lines 37-41 of Curry). The example shown in figure 5a of Curry enhances the edge of a halftone image (column 7, lines 37-41 of Curry). Curry further discloses that image enhancement templates can be defined by an author (column 7, lines 39-41 of Curry), thus allowing for a plurality of different types of available enhancements.

Curry does not disclose expressly that said plurality of image enhancement procedures includes resolution doubling and toner conservation procedures.

Wright discloses a toner conservation procedure (column 5, lines 18-23 of Wright).

Curry and Wright are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include toner conservation as one of the image enhancement procedures. The motivation for doing so would have been to save toner on many documents when a dark gray may be suitable (column 1, lines 63-67 of Wright). Therefore, it would have been obvious to combine Wright with Curry.

Curry in view of Wright does not disclose expressly that said plurality of image enhancement procedures includes a resolution doubling procedure.

Harrington discloses resolution doubling of image data (figure 11; figure 12; and column 5, lines 60-67 of Harrington).

Curry in view of Wright is combinable with Harrington because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include resolution doubling as one of the image enhancement procedures. The motivation for doing so would have been to improve the quality of line graphics and text (column 5, lines 62-63 of Harrington). Therefore, it would have been obvious to combine Harrington with Curry in view of Wright to obtain the invention as specified in claim 3.

Regarding claim 4: Curry discloses that all of said plurality of image enhancement procedures are applied to enhance print quality of said bitmap image (column 9, lines 13-17 of Curry). Since the enhanced data is output to a printer (column 9, lines 13-17 of Curry), the print quality will also be enhanced.

Regarding claim 7: Curry in view of Wright does not disclose expressly that said plurality of image enhancement procedures includes resolution doubling technology.

Harrington discloses resolution doubling technology (figure 11; figure 12; and column 5, lines 60-67 of Harrington).

Curry in view of Wright is combinable with Harrington because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include resolution doubling as one of the image enhancement procedures. The motivation for doing so would have been to improve the quality of line graphics and text (column 5, lines 62-63

of Harrington). Therefore, it would have been obvious to combine Harrington with Curry in view of Wright to obtain the invention as specified in claim 7.

Regarding claim 12: Curry discloses a laser printer (figure 1 of Curry). Figure 9 of Curry shows the image enhancement apparatus that functions as part of said laser printer (column 4, lines 35-38 and column 9, lines 14-16 of Curry).

Said laser printer comprises a processor (figure 1(35) and column 5, lines 31-34 of Curry). Since said processor has to transfer data to other digital electronic elements (column 5, lines 31-36 of Curry), it is inherent that said laser printer further comprises a bus to which said processor is connected.

Said laser printer further comprises a laser print engine (figure 1(38) and column 5, lines 34-38 of Curry). Since said laser print engine must receive data to print (column 5, lines 34-36 of Curry), it is inherent that said laser print engine is connected to said bus.

Said laser printer further comprises a first memory device (figure 9(180) and column 9, lines 1-6 of Curry). Said first memory device contains the templates which perform the various image enhancement procedures (column 9, lines 7-11 of Curry).

Said memory device comprises a procedure which outputs the enhanced image data to a printer (column 9, lines 11-17 of Curry) and is therefore a halftone procedure.

Said memory device further comprises a resolution enhancement procedure (figure 7a and column 8, lines 15-21 of Curry). An increased number of bits is used for each pixel (column 8, lines 19-21 of Curry), thus producing an enhanced resolution.

Said memory device further comprises a halftone enhancement procedure (figure 5a and column 7, lines 37-41 of Curry). The example shown in figure 5a of Curry enhances the edge of a halftone image (column 7, lines 37-41 of Curry).

Said memory device further comprises a dynamic switching procedure for dynamically selecting and nonexclusively applying said resolution enhancement procedure and said halftone enhancement procedure to a complex bitmap image (column 9, lines 5-11 of Curry). The enhancement procedure selected is selected for each window of pixels based on template matching (column 9, lines 5-11 of Curry). Therefore, since different windows of pixels will have different properties, the template selected will be different for different windows.

Curry does not disclose expressly a text and line art procedure; and a toner conservation procedure.

Wright discloses a toner conservation procedure (column 5, lines 18-23 of Wright).

Curry and Wright are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the toner conservation procedure as one of the image enhancement procedures and to dynamically switch between all of the image enhancement procedures including said toner conservation procedure. The motivation for doing so would have been to save toner on many documents when a dark gray may be suitable (column 1, lines 63-67 of Wright). Therefore, it would have been obvious to combine Wright with Curry.

Curry in view of Wright does not disclose expressly a text and line art procedure.

Harrington discloses a procedure for enhancing text and line art data (figure 11; figure 12; and column 5, lines 60-67 of Harrington).

Curry in view of Wright is combinable with Harrington because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the text and line art procedure as one of the image enhancement procedures and to dynamically switch between all of the image enhancement procedures including said toner conservation procedure. The motivation for doing so would have been to improve the quality of line graphics and text (column 5, lines 62-63 of Harrington). Therefore, it would have been obvious to combine Harrington with Curry in view of Lin and Wright to obtain the invention as specified in claim 12.

Regarding claim 13: Curry discloses that the template decoding logic (figure 9(184) of Curry) matches a window of input data with a superset of templates (column 9, lines 3-6 of Curry). The window of input data is stored in the shift registers (figure 9(182) of Curry) which input said window into said template decoding logic (column 9, lines 1-4 of Curry). Said template decoding logic outputs the enhanced data (column 9, lines 10-13 of Curry). Since said template decoding logic is not connected to anything else, as can clearly be seen in figure 9 of Curry, said superset of templates must be stored as part of said template decoding logic. Said dynamic switching procedure controls which template is used based on template matching (column 9, lines 5-11 of Curry). Since the templates are tested against the input image data (column 9, lines 5-

11 of Curry), then the requirements for each image processing mode corresponding to said templates must inherently be included. Otherwise, there is no basis with which to test the input image data against said templates. As discussed in the arguments regarding claims 12, the plurality of procedures includes said toner conservation procedure, said resolution enhancement procedure and said halftone enhancement procedure.

Regarding claim 14: As discussed in the arguments regarding claim 13, which are incorporated herein, said superset of templates is stored as part of said template decoding logic, which is a part of said first memory device (figure 9(180) and column 9, lines 1-4 of Curry). Since said template decoding logic is connected only to the sampled output means (figure 9(186) of Curry) and the shift registers (figure 9(182) of Curry), as can clearly be seen in figure 9 of Curry, then the template database must be stored in said template decoding logic, which is a part of said first memory device (figure 9(180) of Curry). Since said template decoding logic must match said input window data to one of a plurality of templates (column 9, lines 5-6 of Curry), said superset of templates must comprise a template database in order to access the data corresponding to said templates.

Regarding claims 16 and 19: It is inherent that said resolution enhancement procedure stored in said first memory device includes resolution enhancement technology. Without some form of resolution enhancement technology, there would be no resolution enhancement procedure to perform.

Regarding claims 17 and 21: Curry in view of Wright does not disclose expressly that said resolution enhancement procedure includes resolution doubling technology.

Harrington discloses resolution doubling technology (figure 11; figure 12; and column 5, lines 60-67 of Harrington).

Curry in view of Wright is combinable with Harrington because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include resolution doubling technology as part of the resolution enhancement procedures. The motivation for doing so would have been to improve the quality of line graphics and text (column 5, lines 62-63 of Harrington). Therefore, it would have been obvious to combine Harrington with Curry in view of Wright to obtain the invention as specified in claims 17 and 21.

Regarding claim 18: Curry discloses that said dynamic switching procedure comprises a superset of image processing templates configured for a plurality of image enhancement procedures (column 9, lines 3-6 of Curry). Said dynamic switching procedure controls which template of said superset is used based on template matching (column 9, lines 5-11 of Curry). As discussed in the arguments regarding claims 12, the plurality of procedures includes said toner conservation procedure, said resolution enhancement procedure and said halftone enhancement procedure.

A complex bitmap image is stored at a bit depth suitable for processing by all of said plurality of image enhancement procedures (column 8, lines 56-62 of Curry). Since

the bit depth of the image data is based on the input device (column 8, lines 56-62 of Curry), the bit depth will therefore be suitable for the types of image enhancement processing that are available for said device.

Said superset of image processing templates are windowed over said stored complex bitmap image (column 8, lines 31-34 of Curry) to identify matching regions in said bitmap image matching said template (column 8, lines 35-39 of Curry).

One or more of said plurality of image enhancement procedures are selectively applied to said identified regions enhance a raster image of said complex bitmap image (column 8, lines 40-42 and lines 45-47 of Curry). Said complex bitmap data is input as raster image data (figure 9(172) and column 8, lines 50-52 of Curry).

Said enhanced raster image is printed (column 9, lines 13-17 of Curry).

Regarding claim 20: Curry discloses that said dynamic switching procedure allows said resolution enhancement technology to smooth fine black and white edges in said stored complex bitmap image (figure 4b; figure 5b; and column 7, lines 29-32 and lines 37-39 of Curry). The original image to be enhanced (figure 4b and column 7, lines 29-32 of Curry) is enhanced using an image processing template to smooth the fine black and white edges in said stored complex bitmap image (figure 5b and column 7, lines 37-39 of Curry). Curry further discloses that said image processing templates are configured based on the definitions given by an author (column 9, lines 5-6 of Curry).

Curry does not disclose expressly that said dynamic switching procedure allows said toner conservation procedure to simultaneously lighten full black areas in said stored complex bitmap image.

Wright discloses a toner conservation procedure (column 5, lines 18-23 of Wright).

Curry and Wright are combinable because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include both the toner conservation procedure and the resolution enhancement procedure as part of a single, author-defined image enhancement procedure. The motivation for doing so would have been to be able to save toner on many documents when a dark gray may be suitable (column 1, lines 63-67 of Wright) while smoothing the edges of the stored data (column 7, lines 37-39 of Curry). An author may wish to define an image processing template that can perform more than one image processing function. Therefore, it would have been obvious to combine Wright with Curry to obtain the invention as specified in claim 20.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Curry (US Patent 5,479,584) in view of Wright (US Patent 5,986,681), Harrington (US Patent 5,953,464) and Lin (US Patent 5,742,703).

Regarding claim 15: Curry discloses that said template decoding logic (figure 9(184) of Curry) must match said input window data to one of a plurality of templates (column 9, lines 5-6 of Curry). Therefore, said superset of templates, discussed in the arguments regarding claim 13, must comprise a template database in order to access the data corresponding to said templates.

Curry in view of Wright and Harrington does not disclose expressly that said template database is stored in a second memory device, said second memory device connected to said bus.

Lin discloses a template database stored in a memory device (figure (78) of Lin) that is separate from the selector (figure 2(88) of Lin) that selects the template to be used (figure 2; and column 8, lines 14-20 and lines 42-44 of Lin).

Curry in view of Wright and Harrington is combinable with Lin because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to store the template database in a separate, second memory device. Said second memory device would have to be connected to said bus since said second memory device would otherwise not be able to communicate data with the rest of the apparatus. The motivation for doing so would have been to be able to choose a default output when no template is matched (column 8, lines 14-16 of Lin), which would therefore not require the default template and corresponding default template database to be stored in said second memory device.

7. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curry (US Patent 5,479,584) in view of Lin (US Patent 5,742,703), Wright (US Patent 5,986,681) and Harrington (US Patent 5,953,464).

Regarding claim 9: Curry discloses an apparatus (figure 9 of Curry) comprising a memory (figure 9(176) of Curry) for storing (column 8, lines 50-54 of Curry) gray value image data (column 6, lines 31-36 of Curry).

Said apparatus further comprises a template decoding logic (figure 9(184) of Curry) which contains and selects between a plurality of image enhancement circuitry (column 9, lines 5-11 of Curry).

Said apparatus further comprises halftone image enhancement circuitry (figure 9 (184(portion) and column 7, lines 37-41 of Curry)). Said halftone image enhancement circuitry is a part of the overall circuitry of the template decoding logic (figure 9(184) and column 9, lines 5-11 of Curry).

Said apparatus further comprises enhancement mode selection circuitry (figure 9 (184(portion) of Curry)) for selectively engaging one of a plurality of image enhancement circuitry (column 9, lines 5-11 of Curry). Said enhancement mode selection circuitry is a part of the overall circuitry of the template decoding logic (figure 9(184) and column 9, lines 5-11 of Curry).

Curry does not disclose expressly a multiplexer with multiple inputs, a single output and a selection line; text and line art enhancement circuitry coupled between said memory and a first of said multiple inputs of said multiplexer; that said halftone image enhancement circuitry is coupled between said memory and a second of said multiple inputs of said multiplexer; toner conservation circuitry coupled between said memory and a third of said multiple inputs of said multiplexer; and that said enhancement mode selection circuitry is coupled between said memory and said

selection line of said multiplexer and selectively engages said text and line art enhancement circuitry, said halftone image enhancement circuitry and said toner conservation circuitry.

Lin discloses a multiplexer (figure 2(88) of Lin) with multiple inputs (figure 2 (80→88,86→88) of Lin), a single output (figure 2("high addressage output") of Lin) and a selection line (figure 2(78→88) of Lin) (column 8, lines 42-47 of Lin).

Lin further discloses enhancement mode selection circuitry (figure 2(78) of Lin) coupled between image data (figure 2(70) of Lin) and said selection line of said multiplexer for selectively engaging a particular one of a plurality of enhancement circuitry (column 8, lines 15-20 and lines 42-44 of Lin). Said enhancement mode selection circuitry analyzes the input image data and produces a resultant tag signal (column 8, lines 15-20 of Lin), which is then used to control the selection of the output of said multiplexer (column 8, lines 42-44 of Lin).

Curry and Lin are combinable because they are from the same field of endeavor, namely the selective application of image enhancement to halftone image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use a multiplexer and associated selection circuitry as part of the template decoding logic (figure 9(184) of Curry) for selecting one of a plurality of image enhancement templates. The motivation for doing so would have been that a multiplexer is one way to select between various inputs and simply requires a selection tag signal to select between said inputs (column 8, lines 42-44 of Lin). Therefore, it would have been obvious to combine Lin with Curry.

Curry in view of Lin does not disclose expressly text and line art enhancement circuitry coupled between said memory and a first of said multiple inputs of said multiplexer; and toner conservation circuitry coupled between said memory and a third of said multiple inputs of said multiplexer.

Wright discloses toner conservation circuitry (figure 1(17) and column 2, lines 53-55 of Wright) (column 5, lines 18-23 of Wright). The data processor (figure 1(17) of Wright) processes the image data based on the control language or mode to which said data processor is set (column 2, lines 53-55 of Wright), which includes a plurality of toner conservation modes (column 5, lines 18-23 of Wright).

Curry in view of Lin is combinable with Wright because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the toner conservation circuitry taught by Wright as one of the image enhancement circuits coupled between the image data memory and an input of said multiplexer. The motivation for doing so would have been to save toner on many documents when a dark gray may be suitable (column 1, lines 63-67 of Wright). Therefore, it would have been obvious to combine Wright with Curry in view of Lin.

Curry in view of Lin and Wright does not disclose expressly text and line art enhancement circuitry coupled between said memory and a first of said multiple inputs of said multiplexer.

Harrington discloses text and line art enhancement circuitry (figure 23("text decode") and column 7, lines 31-35 of Harrington) (figure 11; figure 12; and column 5,

lines 60-67 of Harrington). Embodied in a block of circuitry (figure 23("text decode") and column 7, lines 31-35 of Harrington) is a procedure for enhancing text and line art data (figure 11; figure 12; and column 5, lines 60-67 of Harrington).

Curry in view of Lin and Wright is combinable with Harrington because they are from the same field of endeavor, namely halftone image processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include the text and line art enhancement circuitry taught by Harrington as one of the image enhancement circuits coupled between the image data memory and an input of said multiplexer. The motivation for doing so would have been to improve the quality of line graphics and text (column 5, lines 62-63 of Harrington). Therefore, it would have been obvious to combine Harrington with Curry in view of Lin and Wright to obtain the invention as specified in claim 9.

Regarding claim 10: Curry discloses a template database (figure 3b(94) and column 4, lines 18-20 of Curry) wherein said template database is a superset of templates representing all image processing modes requirements (column 7, lines 3-9 of Curry). Figure 3b(94) of Curry represents the templates that are stored and are to be tested against an input bitmap image (column 7, lines 3-7 of Curry) in order to generate enhanced image data (column 7, lines 7-9 of Curry). Since the templates are tested against the input image data (column 7, lines 3-7 of Curry), then the requirements for each image processing mode corresponding to said templates must inherently be included. Otherwise, there is no basis with which to test the input image data against said templates.

Regarding claim 11: Curry discloses that said apparatus (figure 9 of Curry) comprises an input (figure 9(172) of Curry), memory (figure 9(176) of Curry), an address counter (figure 9(178) of Curry), shift registers (figure 9(182) of Curry), template decoding logic (figure 9(184), and sampled output means (figure 9(186), which are used for the purpose of enhancing data in a printing system (column 8, lines 48-50 and column 9, lines 13-17 of Curry). Since said apparatus comprises circuitry which performs specific operations for a specific device (printer), instead of, for example, being embodied as code on a personal computing system, said apparatus is therefore implemented in an application specific integrated circuit (ASIC).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Loce et al., US Patent 6,678,414 B1, 13 January 2004, filed 17 February 2000.

Joidon et al., US Patent 6,389,163 B1, 14 May 2002, filed 18 November 1994.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Thompson whose telephone number is 703-305-6329. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703-308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
Art Unit 2624

JAT
July 8, 2004

THOMAS D.
[redacted] LEE
PRIMARY EXAMINER